

AMENDMENTS TO CLAIMS

1. (Currently Amended) A camera module for mobile communication terminals, comprising:

an image capture device unit for focusing an image of a subject;

[a] an LED (light emitting diode) unit for emitting light to the subject;

a FPC (flexible printed circuit) electrically connected between the image capture device unit and the LED unit; and

a connector unit for applying an electric signal to the image capture device unit.

2. (Original) The module as set forth in claim 1, wherein the image capture device unit comprises:

a housing having a space defined therein;

a camera lens disposed to the upper part of the housing for focusing the image of the subject; and

an image capture device PCB (printed circuit board) adapted for supporting the housing,

wherein the PCB has an image sensor for capturing the image of the subject mounted to the middle upper surface thereof.

3. (Currently Amended) The module as set forth in claim 1, wherein the LED unit comprises:

[a] an LED for emitting light to the subject; and

[a] an LED PCB formed so that the LED is mounted thereon.

4. (Original) The module as set forth in claim 3, wherein the LED is attached to the LED PCB upside down.

5. (Original) The module as set forth in claim 1, wherein the LED unit is mounted on the housing of the image capture device unit.

6. (Original) The module as set forth in claim 1, wherein the LED unit further comprises a retainer for guiding the light emitted from the LED.

7. (Original) The module as set forth in claim 1, wherein the image capture device unit and the LED unit are electrically connected to the FPC, respectively, via a flexible cable connector.

8. (Original) The module as set forth in claim 1, wherein the image capture device unit and the LED unit are electrically connected to the FPC, respectively, by soldering.

9. (Original) The module as set forth in claim 1, wherein the image capture device unit and the LED unit are electrically connected to the FPC, respectively, by

means of anisotropic conductive film, anisotropic conductive paste, or adhesive resin.

10. (Currently Amended) A camera module for mobile communication terminals, comprising:

an image capture device unit for focusing an image of a subject;

[a] an LED for emitting light to the subject;

a FPC including a first flexible part formed so that the image capture device unit is mounted thereon, a second flexible part formed so that the LED is mounted thereon, and a connection part for electrically connecting the first flexible part and the second flexible part, the first flexible part and the second flexible part being integrally formed with the connection part; and

a connector unit for applying an electric signal to the FPC.

11. (Original) The module as set forth in claim 10, wherein the image capture device unit comprises:

a housing having a space defined therein and supported by the first flexible part of the FPC;

a camera lens disposed to the upper part of the housing for focusing the image of the subject; and

an image sensor mounted on the first flexible part of the FPC.

12. (Original) The module as set forth in claim 10, wherein the LED is attached to the second flexible part of the FPC upside down.

13. (Original) The module as set forth in claim 10, wherein the LED is mounted on the housing of the image capture device unit.

14. (Original) The module as set forth in claim 10, further comprising a retainer for guiding the light emitted from the LED.

15. (Currently Amended) A camera module for mobile communication terminals, comprising:

an image capture device unit for focusing an image of a subject;

[a] an LED for emitting light to the subject;

a rigid-flexible PCB including a first rigid part formed so that the image capture device unit is mounted thereon, a second rigid part formed so that the LED is mounted thereon, and a flexible connection part for electrically connecting the first rigid part and the second rigid part; and

a connector unit for applying an electric signal to the rigid-flexible PCB.

16. (Original) The module as set forth in claim 15, wherein the image capture device unit comprises:

a housing having a space defined therein and supported by the first rigid part of the rigid-flexible PCB;

a camera lens disposed to the upper part of the housing for focusing the image of the subject; and

an image sensor mounted on the first rigid part of the rigid-flexible PCB.

17. (Original) The module as set forth in claim 15, wherein the LED is attached to the second rigid part of the rigid-flexible PCB upside down.

18. (Original) The module as set forth in claim 15, wherein the LED is mounted on the housing of the image capture device unit.

19. (Original) The module as set forth in claim 15, further comprising a retainer for guiding the light emitted from the LED.

20. (Original) A camera module for mobile communication terminals, comprising:

an image capture device PCB having an image sensor for capturing an image of a subject mounted to the upper surface thereof;

at least one FPC connected to the image capture device PCB;

at least one part-mounting PCB electrically connected to the image capture device PCB via the FPC;

at least one mobile communication terminal part mounted on the part-mounting PCB; and

a connector unit for applying an electric signal to the image capture device PCB.

21. (Original) A camera module for mobile communication terminals, comprising:

an image sensor for focusing an image of a subject;

at least one mobile communication terminal part;

a FPC including a first flexible part formed so that the image sensor is mounted thereon, at least one second flexible part formed so that the mobile communication terminal part is mounted thereon, and at least one connection part for electrically connecting the first flexible part and the second flexible part; and

a connector unit for applying an electric signal to the FPC.

22. (Original) A camera module for mobile communication terminals, comprising:

an image sensor for focusing an image of a subject;

at least one mobile communication terminal part;

a rigid-flexible PCB including a first rigid part formed so that the image sensor is mounted thereon, at least one second rigid part formed so that the mobile

communication terminal part is mounted thereon, and at least one flexible connection part for electrically connecting the first rigid part and the second rigid part; and
a connector unit for applying an electric signal to the rigid-flexible PCB.

23. (Original) A camera module for mobile communication terminals, comprising:
a housing having a space defined therein;
a camera lens disposed to the upper part of the housing for focusing an image of a subject;
a PCB adapted for supporting the housing, the PCB having an image sensor for capturing the image of the subject mounted to the middle upper surface thereof;
at least one LED disposed on the PCB outside the housing for emitting light to the subject; and
a connector unit for applying an electric signal to the PCB.

24. (Original) The module as set forth in claim 23, further comprising an optical fiber provided around the LED for forwardly guiding the light emitted from the LED.

25. (Original) The module as set forth in claim 23 or 24, further comprising an iris filter (IR filter) disposed in the space of the housing for controlling

an amount of light of the image focused from the camera lens.

26. (Original) The module as set forth in claim 23 or 24, further comprising a lens holder,
wherein the camera lens is attached to the housing via a lens holder.

27. (Original) The module as set forth in claim 23 or 24, wherein the LED is a SMD LED.

28. (Original) The module as set forth in claim 24,
wherein the optical fiber is formed in the shape of a cylinder comprising a core part and a cladding part surrounding the core part, and
wherein the optical fiber has an open end and a closed end, whereby the optical fiber is fitted around the LED through the open end.

29. (Original) The module as set forth in claim 28, wherein the optical fiber is coated with a flexible conduit tube for preventing any bending or damage to the optical fiber due to external impact.

30. (Original) The module as set forth in claim 28, wherein the closed end of the optical fiber is concave.

31 (New). The module as set forth in claim 23 wherein at least one of said mobile communication terminals include a motherboard and wherein said connector has one connected to said PCB and another end connected to said motherboard.

32. (New) A camera module for a mobile communication terminal having a motherboard, comprising:

- an image capture device unit for focusing an image of a subject;
- an LED (light emitting diode) unit for emitting light to the subject;
- a FPC (flexible printed circuit) electrically connected between the image capture device unit and the LED unit; and
- a connector unit connected to said motherboard and at least one of said image capture device and said LED unit for applying an electric signal thereto.